

ABSTRACT

Vertical and horizontal wind shears, yaw misalignment and/or turbulence act together to produce asymmetric loading across a wind turbine rotor. The resultant load produces bending moments in the blades that are reacted through the hub and subsequently to the main shaft. As a result, the main shaft may be radially displaced from its at rest positions. The amount of radial displacement is measured using two or more sensors. The output signals from the sensors are used to determine the magnitude and/or the orientation of the resultant rotor load. This information is used to affect the blade pitch change or other action with similar system effect to reduce the asymmetric load and thereby reduce fatigue and loading on various turbine components.